

CLAIMS

What is claimed is:

1. A process for producing metal loaded carbon filaments, comprising depositing metal on carbon filaments produced from at least one carbon-containing feed.
2. The process of claim 1 wherein the carbon-containing feed comprises an alkane found in natural gas.
3. The process of claim 1 wherein the carbon-containing feed comprises an alkene.
4. The process of claim 1 wherein the carbon filaments are produced before the metal is deposited on the carbon filaments.
5. The process of claim 1 wherein the carbon filaments and the metal are formed concurrently such that the metal is incorporated into the carbon filaments.
6. The process of claim 1 wherein the metal is formed by electroplating.
7. The process of claim 1 wherein the metal is formed by impregnation.
8. The process of claim 7 wherein a metal precursor of the metal comprises a hydroxide, an oxide, a nitrate, a chloride, an organic moiety, or combinations thereof.
9. The process of claim 1 wherein the metal is formed by chemical vapor deposition.
10. The process of claim 1 wherein the carbon filaments and the metal are formed in a single reactor.
11. The process of claim 10 wherein a hydrocarbon and a volatile organometallic compound are concurrently fed to the single reactor.
12. The process of claim 10 wherein the volatile organometallic compound comprises silicon, and wherein the volatile organometallic compound is fed to the single reactor to form silicon coated carbon filaments.
13. The process of claim 1 wherein the carbon filaments and the metal are formed in different reactors.

14. A carbon-based structure comprising a carbon filament and metal disposed on the carbon filament.
15. The carbon-based structure of claim 14 wherein the metal is incorporated in the carbon filament.
16. The carbon-based structure of claim 14 wherein the metal is positioned on an outside surface of the carbon filament.
17. The carbon-based structure of claim 14, being capable of storing a carbon-containing gaseous compound.
18. The carbon-based structure of claim 14, being capable of storing a hydrogen compound.
19. An article of manufacture comprising a carbon filament having metal disposed thereon.
20. The article of manufacture of claim 19 wherein the metal is incorporated in the carbon filament.
21. The article of manufacture of claim 19 wherein the metal is positioned on an outside surface of the carbon filament.
22. The article of manufacture of claim 19 wherein the article of manufacture is a catalyst.
23. The article of manufacture of claim 19 wherein the article of manufacture is a Fischer-Tropsch catalyst.
24. The article of manufacture of claim 19 wherein the article of manufacture is an oxidative dehydrogenation catalyst.
25. The article of manufacture of claim 19 wherein the article of manufacture is an alcohol production catalyst.
26. The article of manufacture of claim 19 wherein the article of manufacture is a composite material.

27. The article of manufacture of claim 19 wherein the article of manufacture is an electrical element.
28. The article of manufacture of claim 19, being capable of storing a gaseous compound.
29. The article of manufacture of claim 19, being capable of storing hydrogen.
30. A carbon-based structure formed by the process of claim 1.
31. The carbon-based structure of claim 30, comprising at least 1 wt. % of the metal per total weight of the carbon filaments.